## 秦巴山区竹子上的瘿螨三新种记述 (蜱螨亚纲、瘿螨总科、瘿螨科)

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摘 要 记述了采自陕西秦巴山区竹子上的瘿螨科 3新种: 纹股新波羽瘿螨 Neocyn op tus ornapodus sp. nov, 寄主慈竹 Neosi oa kmus affnis (Rendk) Keng 刚竹背槽瘿螨 Aulohetus phyllostacher sp. nov, 寄主刚竹属 Phyllostachys sp; 尖嘴四瘿螨 Tetra picrostme sp. nov, 寄主刚竹属 Phyllostachys sp。

关键词 蜱螨亚纲,瘿螨科,新种,竹子.

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瘿螨通常寄生在竹子叶片背面上,用口针刺破细胞,吸取汁液,是一类重要的害螨。世界已经报道 56种瘿螨危害竹子,其中我国已发现 38 种(薛晓峰,2006)。作者于 2008年 7月在陕西的安康和商洛地区的竹子上采集到瘿螨,经鉴定发现 3新种:纹股新波羽瘿螨 Neocyn op tus ornapodus sp nov, 刚竹背槽瘿螨 Auloh etus phyllostach er sp. nov 和尖嘴四瘿螨 Tetra spirostrae sp. nov。描述如下。

新波羽瘿螨属 Neocym optus Lin, Jin & Kuang 1997迄今只发现 1种,即竹新波羽瘿螨 Neocym optus bam busue Lin, Jin & Kuang 1997; 背槽 瘿螨属 Aulodnetus Am rine, 1996迄今只发现 1种,即乳浆大戟背槽瘿螨 Aulodnetus esulae (Liro) Am rine, 1996; 四瘿螨属 Tetra Keifer, 1944 在我国发现 2种为害竹子,即毛竹四瘿螨 Tetra phyllostadyis Kuang & Zhang 1999和玉山箭竹四瘿螨 Tetra yushan in Huang, 2001。

新种标本的采集、保存和制作采用 匡海源 (1995) 方法,然后在奥林巴斯 BX-51 (15 × 100) 下测量和描绘。新种特征描述用语参照 Am rine *et al* (2003)。本文的测量单位为 l-m。模式标本保存在安康学院安康资源生物标本室。

1 纹股新波羽瘿螨,新种 Neocymop tus orna podus sp. nov. (图 1~7)

雌螨 体长 143 (120~155), 宽 43 (35~44), 厚 50 (45~50), 淡黄色,纺锤形。喙长 20 (20~23),近直角下伸。背盾板长 36 (34~37),宽 36 (30~36),有前叶突;背盾板上覆盖蜡质的颗粒;

背中线不明显,侧中线和亚中线完整。背瘤位于盾 后缘上, 瘤距 22 (20~22), 背毛 x 长 50 (50~ 53),斜后指。基节 [间分离;基节上饰有的线条; 基节刚毛 1a 长 12 (10~17), 瘤距 5 (4~5); 基节 刚毛 2a 长 30 (23~30), 瘤距 17 (15~19)。足 I、 足Ⅱ股节和膝节腹面饰有环纹。足Ⅰ长 26 (26~ 27), 股节长 9 (9~ 10), 股节刚毛 bv 长 10; 膝节 长 4,膝节刚毛 l''长 25 (25~ 27); 胫节长 5,胫节 刚毛 l'长 7,着生在胫节侧面近端部 1 B 处;跗节长 6, 跗节背毛 ft' 和侧毛 ft''长 20; 爪长 7, 无端球; 羽状爪单一, 8支。足II长 25, 股节长 9, 股节刚毛 bv 长 15; 膝节长 3, 膝节刚毛 l"长 7; 胫节长 5; 跗 节长 6, 跗节背毛 ft 长 5, 跗节侧毛 ft 卷 20 ft 15~ 20); 爪长 7, 无端球; 羽状爪单一, 8支。体有背 环 48~51个, 形成一个背中脊和两个侧脊, 背中脊 从盾板后一直延伸到体末第 12~ 15背环, 侧脊从盾 板后一直延伸到体末第 5~8背环。背环饰有不规则 微瘤, 且常覆盖蜡质和蜡丝。体有腹环 68~72个, 除体末 8~9个腹环饰有条形微瘤外,其他腹环均饰 有球形微瘤。 侧毛 €2长 25 (20~30), 瘤距 32 (20 ~ 32), 生于第 9~ 10腹环; 腹毛 d 长 33 (33~ 55), 瘤距 22 (16~22), 生于第 24~25腹环; 腹 毛 e长 40 (40~ 50),瘤距 16 (12~ 16),生于第 43 腹环; 腹毛 f长 20, 瘤距 12 (12~14), 生于体末 第 6腹环。尾毛 h 2长 60 (50~70); 副毛 h 1长 4 雌性外生殖器长 12 (10~12), 宽 18 (17~19); 生 殖器盖片饰有一排纵肋,10~12条; 性毛 3a长 15 (11~15), 瘤距 15 (15~16)。

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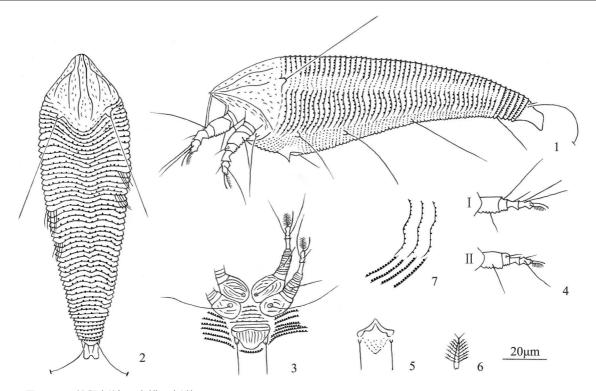


图 1~7 纹股新波羽瘿螨,新种 Neogmoptus omapodus sp nov.

1 雌侧面观 (lateral view of female) 2 雌背面观 (dorsal view of female) 3 足基节和雌外生殖器 (coxae and genitalia of female) 4 足I、II (legI、legI) 5 雄外生殖器 (male genitalia) 6 羽状爪 (empodium) 7 背环和腹环侧面观 (lateral view of dorsal annuli and ventral annuli) 比例尺 (scale bar) = 1~5

雄螨 体长 100 (98~ 105), 宽 40 (33~ 40)。雄性外生殖器宽 17 (15~ 17), 性毛 3a 长 13 (13~ 15), 瘤距 12 (12~ 14)。

正模  $\,^\circ$  、 2008-07-09、陕西省安康市香溪洞风景区 (32.66°N, 109.04°E)、谢满超采、寄主慈竹 Neosinoalamus affinis (Rendle) Keng (禾 本 科 Gram ineae)。副模:  $199\,^\circ$  、  $6\,^\circ$  、 其中  $49\,^\circ$  和  $1\,^\circ$ 与正模同时采到、另外  $159\,^\circ$  和  $5\,^\circ$  、 2008-07-07、安康市 (32.69°N, 109.02°E) 安康公园、谢满超采、寄主同上。该螨在叶背面自由生活、未见明显危害状。

新种与竹新波羽瘿螨 Neocym quus bam busae Lin, Jin & Kuang 1997相似,但有以下差异:新种有副毛,羽状爪 8支,股节和膝节腹面饰有环纹。而竹新波羽瘿螨无副毛,羽状爪 5支,股节和膝节腹面无环纹。

词源:新种种本名 omapodus 由拉丁词 om、 pad 和 us构成, om 是修饰的意思; pod 是足的意思; us 是阳性后缀。

2 刚竹背槽瘿螨,新种 Acu loch etu s phyllosta cher sp. nov (图 8~13)

雌螨 体长 167 (135~169), 宽 56 (50~57),

厚 50、淡黄色、纺锤形。喙长 22、斜下伸;喙端毛 d长 7, 顶端不分叉。背盾板长 43 (42~43), 宽 49 (49~50), 常饰有颗粒; 前叶突明显。背中线仅存 盾板后缘前约 1/4, 端部分叉, 与侧中线相连; 侧 中线波形,约在其 1/2处被一短线横截;有亚中线。 背瘤位于盾后缘上,瘤距 29,背毛 x长 6,后指。 基节 [间分离;基节上饰有粒点和短线;基节刚毛 1b长 5, 瘤距 10; 基节刚毛 1a 长 8, 瘤距 7 (7~ 9); 基节刚毛 2a 长 22 (22~ 25), 瘤距 23 (21~ 23)。足I 长 28 (2~28),股节长 10 (9~10),股 节刚毛 bv 长 10 (7~ 10); 膝节长 5 (4~ 5), 腹面 饰有环纹, 膝节刚毛 l"长 24 (24~ 26); 胫节长 5, 胫节刚毛 l'长 5 (5~ 6), 生于胫节侧面近 1/2 处; 跗节长 6, 跗节背毛 ft 和侧毛 ft K 18, 跗节中毛 u 长4; 爪长7, 无端球; 羽状爪单一, 6支。足 II 长 27 (26~27), 股节长 10 (9~10), 股节刚毛 bv 长 15 (12~ 15); 膝节长 4, 腹面饰有环纹, 膝节刚毛 l''长 10 (9~10); 胫节长 5; 跗节长 6, 跗节背毛 ft'长 5、 跗节侧毛 ft''长 18、 跗节中毛 u'长 4、 爪长 7、 无端球;羽状爪单一,6支。体有背环49~52个, 形成 2个侧脊和一个窄的背中槽 (背中槽的宽小于 背盾板上两背瘤之距),从盾板后缘一直延伸到体末 第 5~ 6背环。背环饰有球形微瘤 (背中槽光滑或饰

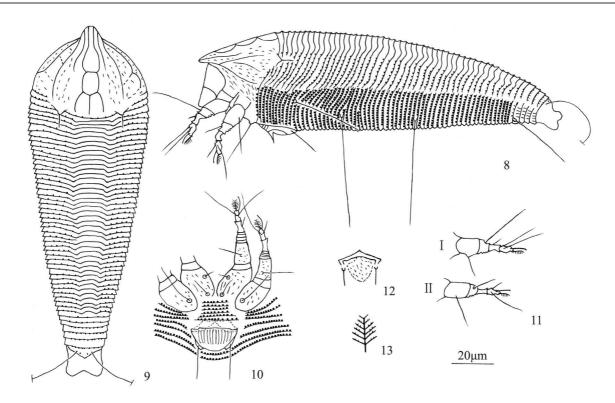


图 8~13 刚竹背槽瘿螨,新种 Aulohetus phyllostacher sp. nov 8 雌侧面观 (lateral view of fem ale) 9. 雌背面观 (dorsal view of fem ale) 10. 足基节和雌外生殖器 (coxae and genitalia of fem ale) 11. 足 I 、II (leg I 、 leg II) 12 雄外生殖器 (male genitalia) 13. 羽状爪 (empodium) 比例尺 (scale bar) = 8~12

有少量微瘤 )。腹环 69~ 74个,除体末 5个腹环饰有条形微瘤外,其余腹环饰有球形微瘤。侧毛  $\epsilon$ 2长 33 (22~35),瘤距 45 (38~45),生于第 11腹环;腹毛 d长 50 (45~58),瘤距 30 (29~31),生于第 23~24腹环;腹毛  $\epsilon$ 长 50 (50~55),瘤距 20 (19~20),生于第 41~42 腹环;腹毛  $\epsilon$ 长 30 (27~30),瘤距 20 (20~21),生于体末第 5腹环。尾毛  $\epsilon$  42 长 45,副毛极短。雌性外生殖器长 11  $\epsilon$  12  $\epsilon$  12  $\epsilon$  30  $\epsilon$  16  $\epsilon$  18  $\epsilon$  18  $\epsilon$  16  $\epsilon$  16  $\epsilon$  16  $\epsilon$  16  $\epsilon$  18  $\epsilon$  16  $\epsilon$  16  $\epsilon$  16  $\epsilon$  16  $\epsilon$  18  $\epsilon$  18  $\epsilon$  16  $\epsilon$ 

雄螨 体长 118 (118~138), 宽 40 (40~45)。 雄性外生殖器宽 18 (18~20), 性毛 3a 长 8 (8~10), 瘤距 14 (13~15)。

正模  $\,^\circ$  ,副模:  $\,^\circ$  2 $\,^\circ$  、 $\,^\circ$  3008-07-23 陕西省商南县金丝峡风景区 (33.52 $\,^\circ$ N, 110.88 $\,^\circ$ E),谢满超采,寄主是刚竹属  $\,^\circ$   $\,$ 

新种与乳浆大戟背槽瘿螨 Acubchetus esulae (Liro) Am rine, 1996相似, 但有以下差异: 新种有背中线和亚中线, 侧中线与一横线相交, 后体两个侧脊不汇合, 副毛极短。而乳浆大戟背槽瘿螨无背中线, 侧中线不与横线相交, 后体两侧脊汇合, 副

毛长。

词源:新种种本名 phyllostacher 由拉丁词 phyllostach和 er构成。前者来源于刚竹属的属名,后者是阳性后缀。

3 尖嘴四瘿螨,新种Tetra spicrostrae sp. nov. (图 14~20)

雌螨 体长 160 (113~ 200), 宽 53 (40~ 53), 厚 60 (50~60), 淡黄色, 纺锤形。喙长 33 (28~ 33),从基部向前突然变细,弯成直角下伸,背盾板 长 41 (38~44), 宽 45 (35~45), 光滑或覆盖蜡质 的颗粒;侧面观前叶突盖过喙基部,端部尖锐;背 中线近末端处分叉,与侧中线相连;侧中线完整; 有亚中线; 盾板后缘有一弧形线。背瘤位于盾后缘 上, 瘤距 35 (26~35), 背毛 x长 10 斜后指。基 节Ⅰ间有胸线;基节上饰有线条和粒点;基节刚毛 1b长 10 (10~ 12), 瘤距 7 (7~ 9); 基节刚毛 1a 长 20 (20~30), 瘤距 6 (4~6); 基节刚毛 2a 长 30 (30~40), 瘤距 20 (12~20)。足 I 长 35 (33 ~ 36), 股节长 12 (10~ 12), 股节刚毛 bv 长 15 (15~17); 膝节长 5, 腹面饰有环纹,膝节刚毛 l''长 33 (27~ 33); 胫节长 9 (9~ 10), 胫节刚毛 l'长 10 (8~ 10), 着生在胫节侧面近 1/2处; 跗节长 7

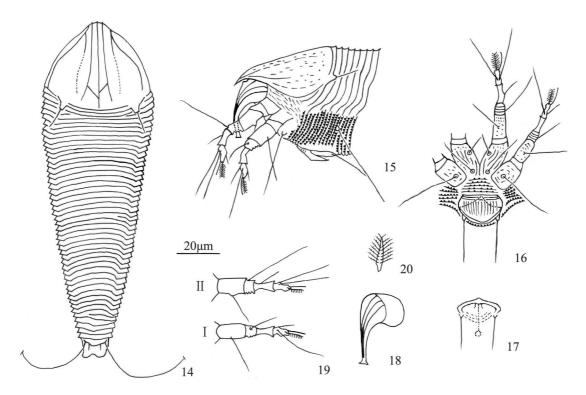


图 14~ 20 尖嘴四瘿螨, 新种 Tetra spicrostrae sp nov.

14. 雌背面观 (dorsal view of female) 15. 雌颚体和足体侧面观 (lateral view of gnatho soma and legs of female) 16. 足基节和雌外生殖器 (coxae and genitalia of female) 17. 雄外生殖器 (male genitalia) 18. 喙侧面观 (lateral view of rostnum) 19. 足I、II (legI、 legII) 20. 羽状爪 (empodium) 比例尺 (scale bar) = 14~19

(7~8),跗节背毛  $f^{\prime}$ 和侧毛  $f^{\prime\prime}$ 长 25,中毛  $u^{\prime}$ 长 5; 爪长 8, 无端球; 羽状爪单一, 8支。足 II长 34 (31 ~ 35), 股节长 12 (10~ 12), 股节刚毛 bv 长 20; 膝节长 5. 腹面饰有环纹, 膝节刚毛 l''长 13 l'13~ 17); 胫节长 8 (7~8); 跗节长 7 (7~8), 跗节背 毛 f'长 7,跗节侧毛 f'长 25,跗节中毛 u'长 5;爪 长 8, 无端球; 羽状爪单一, 8支。体有背环 49~51 个,形成一个宽的背中槽,从盾板后缘一直延伸到 体末第 6背环; 背环光滑或饰有蜡质颗粒。体有腹 环 71 (71~73) 个,除体末 5个腹环饰有条形微瘤 外,其他腹环均具球形微瘤。侧毛 c 2长 42 f 40~ 42), 瘤距 40 (26~40), 生于第 12~13 腹环; 腹 毛 d长 60 (60~68), 瘤距 28 (20~28), 生于第 24~25腹环; 腹毛 e长 50 (40~65), 瘤距 18 (15 ~ 18), 生于第 43~ 44 腹环; 腹毛 f长 30 (25~ 30),瘤距 15 (13~ 15),生于体末第 5腹环。尾毛 h 2长 75; 副毛 h 1 长 3。雌性外生殖器长 15, 宽 22; 生殖器盖片饰有一排纵肋,12~16条;性毛3a长 20 (20~24), 瘤距 17 (15~17)。

雄螨 体长 132, 宽 47。雄性外生殖器宽 20, 性毛 3a长 15, 瘤距 15。

正模♀, 副模: 8♀♀, 1 ₺, 2008-07-08, 安康

市迎风乡 (32.63°N, 109.09°E) 红霞村, 谢满超 采。寄主 刚 竹 属 *Phyllostachys* sp. (禾 本 科 Gram ineae)。该螨在叶背面自由生活, 未见明显危 害状。

新种与毛竹四瘿螨 Tetra phyllostachy is Kuang & Zhang 1999相似,但有以下差异:新种的喙尖细,弯成直角下伸,背中线近末端分支,背盾板后缘有一弧形线,膝节腹面饰有环纹。而毛竹四瘿螨喙斜下伸,背中线末端箭头状,背盾板后缘无弧线,膝节腹面无环纹。

词源:新种种本名 spicrostrae 由拉丁词 spic rostr和 ae构成,spic尖细的意思; rostr喙的意思; ae 是阴性后缀。

## REFERENCES (参考文献)

Am rine, J. W. Jr., Stasny, T. A. H. and Flechmann, C. H. W. 2003. Revised Keys to the World Genera of Eriophyoidea (Acari Prostigmata). Indira Publishing House, Michigan, USA 244pp.

Huang K-W 2001 Eriophyo id m ites of Taiwan: description of Eightysix species from the Tengchih Area Bulktii of the National Musaum of Natural Scin a; 14: 55-56

Kuang H-Y 1995. Economic Insect Fauna China Fasc 44 (Acari Eriophyoidea). I. Science Press Bejing 182pp [匡海源, 1995 中国经济昆虫志,蜱螨亚纲,瘿螨总科 (一). 北京: 科学出版社. 182]

Kuang H-Y, Luo, G-H and Wang A-W 2005 Fauna of Eriophyid

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M ites from China (Acari Eriophyoidea). II. China Forestry Publishing House Beijing 127pp [匡海源,罗光宏,王爱文, 2005. 中国瘿螨志 (二). 北京: 中国林业出版社. 127]

Kuang H-Y and Zhang Y-X 1999. Two new species of genus Tetra Keifer (Acari Eriophyo idea) from China Enton otaxononia, 21 (2): 149-152

Lin, F-P, Jin, C-L and Kuang H-Y 1997. A new genus and six new species of Eriophyidae from China (Acari Eriophyoidea). Acta En tm ologia Sin ia, 40 (1): 86-93

Liro J. I 1943. Ueber neue oder sonst bemerkenswert finnische

Eriophy iden (Acarina). Amales Zoologia Societatis Zoologiae Bo tm iae Femina, Vanano, 9 (3): 32.

Xue, X-F, Song Z-W, Amrine, J. W. Jr and Hong X-Y 2006 Eriophyid mites (Acari Eriophyoidea) on bamboo from China with descriptions of three new species from the Qinling Mountains Amals of the Entomological Society of America, 99 (6): 1057-1063.

Xue, X-F, Song ZW and Hong X-Y 2006 A taxonom is study of the genus Tetra Keifer (Acari Eriophyidae Phyllocoptinae Anthocoptini) from Shaanxi Province Ch ina with descriptions of n ine new species Zωtaxa, 1 249: 1-22

## THREE NEW SPECIES OF ERIOPHYID MITES (ACARI, ERIOPHYOIDEA, ERIOPHYIDAE) ON BAMBOO FROM THE QINLING—DABASHAN REGION, SHAANXI, CHINA

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Abstract Three new species of the family Eriophyidae, Neogmoptus omapadus sp. nov., Aulodietus phyllostudier sp. nov. and Tetra spirostrae sp. nov., are described and illustrated They were collected on bamboo from the Qinling-Dabashan region in Shaanxi, China Type specimens are deposited at the Biological Specimens Collection of Ankang Region in Ankang University, Ankang City, Shaanxi, China Allm easurem ents are given in micrometers

1 N eocym optus om a podus sp. nov. (Figs 1-7)

Female Body fusiform. Gnathosoma projecting near straightly downward Prodorsal shield with frontal lob Shield design with wax median line faint and admedian lines and submedian lines complete Scapular tubercles on rearmargin, scapular setae (sc)) directed posteriorly and laterally. Coxal area with lines stemal line absent setae 1b missing Legs with standard segments and setae, and ventral area of femora and genu omamented with lines Tarsal solenidion unknobbed Empodium simple, 8-rayed Dorsal opisthosoma with a middorsal ridge and two ateral ridges and the middorsal ridge ending before lateral ridges Dorsum with 48-51 annuli microtubercles covered with granules and wool-like wax ventrally with 68-72 annuli, with rounded microtubercles except caudal 8-9 ventral annuli with elongated microtubercles all ventral setae present. Setae h 1 Present Female genital coverflap with 10-12 bound by bou

Hobtype female China Shaanxi Province, Ankang City, Xiangxidong (32.66°N, 109.04°E), 9 July 2008, from Neosinoa lamus affinis (Rendle) Keng (Gramineae), coll XIE Man-Chao Paratypes 19 females and 6 males, among them 4 females and 1 male with same data as holotype, and the other 15

fem a les and 5 m a les Shaanxi Province, Ankang City, Ankang Park (32.69°N, 109.12°E), 7 July 2008, from the same host as holotype, coll by X IE M an-Chao

Relation to Host The mites are vagrant on the undersurface of leaves No obvious damage to the host was seen

Etymology. omapodus is made up of Latin om, pod and us, om meaning omament, pod meaning legs, and us as masculine ending

Remarks This species is similar to Neocynoptus bambusue Lin, Jin & Kuang 1997, but can be differentiated by setae h 1 present tarsal empodium 8-rayed and lines decorating on ventral area of Fernora and genu of legs

2 Acu loch etus phyllostacher sp. nov. (Figs 8-13)

Female Body fusiform Gnathosoma projecting obliquely down Prodorsal shield with frontal lob Shield design with granules, 1/4 median line present at rear shield, forming a Y-shaped mark and connecting with admedian lines, and one cross-line at 1/2 shield joined admedian lines, submedian lines incomplete Scapular tubercles on rear shield margin, scapular se tae (sc) projecting posteriorly. Coxal area with granules and short lines, 3 pairs of tubercles and setae present, stemal line absent Legs with standard segments and se tae, and ventral area of genu omain ented with lines. Tarsal solenidion unknobbed Empodium simple, 6-rayed

Dorsal opishosoma with one middorsal longitudinal furrow and two lateral ridges, and the width of the furrow less than the distance between scapular tubercles, and two lateral ridges without coalition in the end Dorsum with 49-52 annuli, dorsal annuli with microtubercles, ventrally with 69-74

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annuli with rounded microtubercles except caudal 5 annuli with elongated microtubercles 3 pairs of tubercles and setae present Setae h 1 faint Female genital coverflap with 10-12 longitudinal ridges

Hobtype female China Shaanix Province, Shangnan County, the Jinsi Grand Canyon (33.52°N, 110.88° E), 23 July 2008, from *Phyllosti drys* sp (Gram ineae), coll X IE M an-Chao Para types 2 females and 2 males with the same data as holotype

Relation to Host The mites are vagrant on the undersurface of leaves No obvious damage to the host was seen

E tym ology. Phyllostath and er, phyllostath is derived from the genus name of the host  $p \ln t$  er as masculine ending

Remarks This species is  $\sin i \ker to A \ a \ loh \ et us$  est i e (Liro) Am rine, 1996, but can be differentiated by the median line and abm edian lines present, one cross-line jioned admedian lines, two lateral ridges not fused, setae h 1 faint

## 3 Tetra spicrostrae sp. nov. (Figs 14-20)

For a le Body spindle form. Gna tho som a taper, projecting straightly down Frontal lob acum in a te Shield design smooth or granules of wax, median line bifurcated at rear shield and connected by admedian lines, admedian lines complete, submedian lines present. One arc line present at rear shield. Scapular tubercles on rear shield margin, scapular setae (sc) directed posteriorly and laterally. Coxal area with

Keywords Acari, Eriophyoidae new species bamboo

granules and short lines 3 pairs of tubercles and setae present stemal line present Legs with standard segments and setae, and ventral area of genu omamented with lines Tarsal solenidion unknobbed Empodium simple, 8-rayed Dorsal opisthosoma with onewidemiddorsal longitudinal furrow and two lateral ridges Dorsum with 49-51 annul; smooth or covered with granules of wax ventrally with 71-73 annul; with rounded microtubercles except caudal 5 annuli with elongated microtubercles; 3 pairs of tubercles and setae present Setae h 1 prensent Female genital coverflap with 12-16 longitudinal ridges

Holotype female, China, Shaanxi Province, Ankang Yingfen Town (32.63° N, 109.09° E), Hongxia Village, 8 July 2008, from *Phyllosta drys* sp (Gramineae), coll XIE Man-Chao Paratypes 8 females and 1 males, with the same data as hob type

Relation to Host The mites are vagrant on the undersurface of leaves No apparent damage to the host was observed

Etymology. Spirostrae is made up of Latin spic, rostr and ae, spic meaning taper, rostr meaning rostrum, and ae as feminic ending

Remarks This species is similar to *Tetra* phyllostadyis Kuang & Zhang 1999, but can be differentiated by the gnathosoma taper, projecting straightly down, one arc line present at rear shield, median line bifurcated at rear shield, ventral area of genu of legs omamented with lines